

November 2006

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On the web at:
<http://www.starastronomy.org>



November's Meeting

The next STAR meeting will be 8 PM Thursday Nov 2, 2006 at King of Kings Lutheran Church, 250 Harmony Rd. in Middletown.

Our program will be "New Horizons' Journey to Pluto" by Kevin Kilkenny.

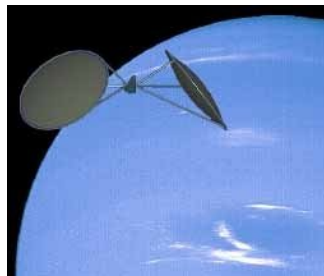
Editor's Corner

Thanks to Randy, Steve Walters, Doug Berger and Steve Fedor, and Theresa Moody for sending in articles. For everyone else, please send in articles on any astronomy topics you like!

Look for a big story in a future issue about the exploits of the Mars rovers. As I write this, Spirit has just passed its 1000th sol on Mars, with Opportunity at the huge Victoria Crater soon to follow. The hardiness of these two robots-which as you've probably read countless times by now were only designed to last 90 days - is a remarkable testament to the skill and dedication of the rover teams.

November Issue

The deadline for the next edition of the *Spectrogram* is Friday, December 1st. Please email any contributions to Daniel_handlin@hths.mcvsd.org. Any and all contributions are welcome!



Conceptual Drawing of a Neptune Orbiter
Image Courtesy NASA

Calendar

Sep 7, 2006 - - Clif Ascraft -
"Restoring the Tuthill
Telescope"

5 Oct, 2006 - Dr. Kenneth
Kremer - "Exploring Mars and
the Search for Life"

2 Nov, 2006 - Dr. Sebastien
Lepine - "The Search for
Nearby Stars"

7 Dec, 2006 - Kevin Kilkenny -
"New Horizons' Journey to
Pluto"

4 Jan, 2007 - Daniel Kirby -
"Pirates of the Solar System
Caribbean"

1 Feb, 2007 - Gavin Warnes -
"Collimating your Telescope"

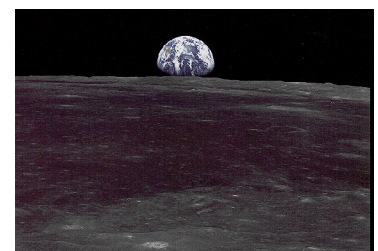
1 Mar, 2007 - David Britz -
"Motions of the Earth and
Moon"

5 Apr, 2007 - TBD

3 May, 2007 - TBD

7 Jun, 2007 - AGM Business
Meeting

Image Courtesy NASA



President's Corner

By Steve Walters

November is upon us, Halloween was just here and Thanksgiving will be here soon! The nights are cooler and start sooner thanks to the end of daylight savings time. But have you noticed the comet yet? Hanging around low in our northern skies, Comet Swan is putting on quite a show! It's brightened to magnitude 4.5 or so, a naked eye object in dark skies. From here in NJ, binoculars let you see it easily and several club members have been out checking out. If you haven't seen it yet, better grab those binoculars, get out right after sunset and take a look! Here's a link to help you find it.

<http://skytonight.com/observing/home/4477131.html>

On a personal note, I've been busy finishing up my "CCDNavigator" application that does session planning for imagers. This is going to be marketed by CCDWare starting in mid November. I'll be traveling to the Advanced Imaging Conference (AIC) in San Jose CA on Nov 10 where it will be introduced. This is keeping me pretty busy but I did have time to go to the Poconos to image a nice face-on galaxy (IC342) in late October. I haven't processed it yet and unfortunately it may be after the AIC when I can get enough time.

Please remember that if you haven't paid your dues already, to get them in. This is the last call, next month we will have to remove you from the S*T*A*R membership role. Please don't let this happen! Thanks!

Hope to see you at the upcoming meeting!

Clear Skies!

Steve...
Clear Skies!

Steve...

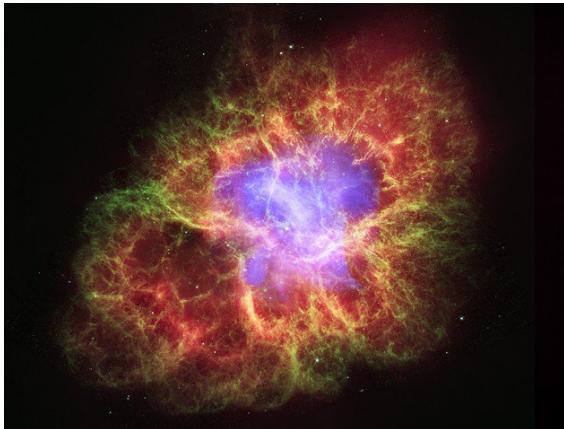


Image courtesy NASA

October Meeting Minutes

By Doug Berger and Steve Fedor

The October 2006 meeting of S*T*A*R Astronomy kicked-off at 8:09 pm on 10/5/2006. The meeting was attended by approximately 34 members and non-members. President Steve Walters chaired the meeting and began by greeting members and non-members as well as discussing club events and a petition to save Pluto as a planet.

Steve asked for suggestions for upcoming speakers and new ideas for how future meetings should be ran. All members are strongly encouraged to help with obtaining speakers.

Steve Walters also announced that club member Daniel Handlin won First Place in the 2006 Jack Horkheimer Service Award. Details are in the September 2006 edition of Reflector, which each club member receives. Congratulations, Daniel!

At 8:25 the evening's lecture "Exploring Mars and the Search for Life in 3D" was presented by NASA Solar System Ambassador Kenneth Kremer. Kenneth displayed numerous images and detailed information on the amazing voyages of NASA's Mars rovers Spirit and Opportunity. Ken Kremer ended his talk with a set of Spirit- and Opportunity-based 3D images, which were viewed by the meeting attendees using 3D glasses.

A 15 minute break was provided.

Doug Berger provided the October Darkness Intervals slide and noted that 10/19 through 10/25 afforded us 10 hours of darkness without interference from the moon.

Nancy McGuire presented the Objects of the Month, which included the comet Swan (beginner object) and Galaxy NGC 1343 (challenge object) in Cassiopeia. Charts were handed out for these objects.

Events and Announcements:

Randy Walton mentioned the upcoming transit of Mercury on 11/8. The first half of the transit would be visible in our area late in the day. The Leonid meteor shower was also mentioned, with the peak expected on the night of 11/18-19 starting around midnight.

A cub scout star party taking place 11/17, which was posted to the club's discussion board based on an email sent to the club, was mentioned. Dennis will follow up.

ATM Committee report - In Gordon Waite's absence, Steve Walters mentioned a couple of items that just completed in Gordon's shop: A mirror by Herb Johnson and a 16" mirror by Gordon for Steve. Club members were encouraged to

visit the shop when the club meets, even if only to see the work that is typically done there.

Observing Committee report - Doug Berger mentioned that he's coordinating with Gavin and Nancy to set up an observing session during or near the weekend of 10/14. Location is TBD and will of course be sensitive to the weather. Schedules may make this problematic, however.

Light Pollution Committee report - John Batinsey mentioned that the light pollution section on the club's web site has been revised. There was discussion about getting form letters for sending to policy makers into the hands of club members to assist in pushing the issues. It was stressed that issues of general public interest, as opposed to astronomy, should be mentioned as reasons to act on light pollution. John will also be setting up an Eatontown meeting / outing to give people a better idea of proper and improper lighting.

Outreach Committee report - Dennis O'Leary is looking into getting our club information into various township newsletters and will seek out assistance from other club members. Similarly, club pamphlets for libraries, supermarkets, and other public establishments will be sought, with focus on areas that have some permanence. Club assistance will be needed for this as well.

Beginner's Committee report - Nancy McGuire reiterated the desire to get an observing session this month in concert with the Observing committee and provide assistance with newcomers' scopes. An email announcement will be sent out once a date is scheduled, in addition to discussion board posting.

The meeting concluded with the 50-50 drawing.

An increase in clouds prevented any observing after the meeting.



Concept drawing of cancelled X-30 National Aerospace Plane

Image courtesy NASA

The Planet in the Machine

By Diane K. Fisher and Tony Phillips

The story goes that a butterfly flapping its wings in Brazil can, over time, cause a tornado in Kansas. The “butterfly effect” is a common term to evoke the complexity of interdependent variables affecting weather around the globe. It alludes to the notion that small changes in initial conditions can cause wildly varying outcomes.

Now imagine millions of butterflies flapping their wings. And flies and crickets and birds. Now you understand why weather is so complex.

All kidding aside, insects are not in control. The real “butterfly effect” is driven by, for example, global winds and ocean currents, polar ice (melting *and* freezing), clouds and rain, and blowing desert dust. All these things interact with one another in bewilderingly complicated ways.

And then there’s the human race. If a butterfly can cause a tornado, what can humans cause with their boundlessly reckless disturbances of initial conditions?

Understanding how it all fits together is a relatively new field called Earth system science. Earth system scientists

work on building and fine-tuning mathematical models (computer programs) that describe the complex inter-relationships of Earth's carbon, water, energy, and trace gases as they are exchanged between the terrestrial biosphere and the atmosphere. Ultimately, they hope to understand Earth as an integrated system, and model changes in climate over the next 50-100 years. The better the models, the more accurate and detailed will be the image in the crystal ball.

NASA's Earth System Science program provides real-world data for these models via a swarm of Earth-observing satellites. The satellites, which go by names like Terra and Aqua, keep an eye on Earth's land, biosphere, atmosphere, clouds, ice, and oceans. The data they collect are crucial to the modeling efforts.

Some models aim to predict short-term effects—in other words, weather. They may become part of severe weather warning systems and actually save lives. Other models aim to predict long-term effects—or climate. But, long-term predictions are much more difficult and much less likely to be believed by the general population, since only time can actually prove or disprove their validity. After all, small errors become large errors as the model is left to run into the future. However, as the models are further validated with near- and longer-term data, and as different models converge on a common scenario, they become more and more trustworthy to show us the future while we can still do something about it—we hope.

For a listing and more information on each of NASA's (and their partners') Earth data-gathering missions, visit science.hq.nasa.gov/missions/earth.html. Kids can get an easy introduction to Earth system science and play Earthy word games at spaceplace.nasa.gov/en/kids/earth/wordfind.

This article was provided by the Jet Propulsion Laboratory, California Institute of Technology, under a contract with the National Aeronautics and Space Administration.



Caption:

CloudSat is one of the Earth observing satellites collecting data that will help develop and refine atmospheric circulation models and other types of weather and climate models. CloudSat's unique radar system reads the vertical structure of clouds, including liquid water and ice content, and how clouds affect the distribution of the Sun's energy in the atmosphere. See animation of this data simulation at www.nasa.gov/mission_pages/calipso/multimedia/cloud_calip_mm.html.

Join Project ASTRO NOVA!

By Theresa Moody

- Are you an amateur or professional astronomer, or an astronomy educator?
- Do you LOVE astronomy?
- Do you like to share what you know about astronomy?

If you answered YES to these questions, you may be interested in volunteering as a Project ASTRO NOVA astronomer! Each school year, Project ASTRO NOVA pairs second to ninth grade teachers with volunteer astronomers. Astronomers commit to making at least four visits to the same one or two classrooms. One class visit is only 60-90 minutes. During these visits astronomers answer students' questions and lead or assist the teacher with astronomy activities. Examples of activities include: Making a Telescope, Stargazing, Exploring the Constellations, the Reason for Seasons, Modeling the Phases of the Moon, Making a Scale Model of our Solar System, Observing the Moons of Jupiter, Making a Comet, Life Cycles of Stars and the Origin of the Universe.

The teacher-astronomer partnerships are established at a two-day workshop. During the workshop, partners develop a strategy for working together, in and out of the classroom, and start planning their astronomy lessons and the first astronomer's visit. Our next training workshop will be on *February 2-3, 2007 (Friday and Saturday)* at Raritan Valley Community College.

Astronomers who are interested in participating should fill out an Astronomer Volunteer Form. On this form, astronomers will be asked for areas of astronomy that are of special interest to them and which grades/ages they prefer to work with. Based on the answers, astronomers will be matched with compatible teachers or youth leaders near their home or work. Each partnership will receive a wide variety of materials and resources for use in their visits, including: The Astronomical Society of the Pacific's "*The Universe at Your Fingertips*" activity and resource notebook, articles about recent astronomical developments, resource lists, access to audio-visual materials, tips on working with schools/groups and students, tips on addressing and working with preconceptions and learning styles, and more.

A representative from Project ASTRO will be at the November 2nd S*T*A*R meeting with forms and more information. Astronomer Volunteer forms and more information can also be obtained from our website at <http://www.raritanval.edu/planetarium/astronova.html> or from Project ASTRO NOVA, Raritan Valley Community College, P.O. Box 3300, Somerville, NJ 08876, (908) 526-1200 x8942 , fax (908) 526-7938, or email tmood@raritanval.edu.

The deadline for submission of Astronomer Volunteer Forms is December 1st.

Science Corner: Microquasars

By Daniel Handlin

Microquasars are, as you might guess from the name, miniature versions of quasars, the ultraluminous galaxies we can see at the very edge of our universe. While the incredible luminosity of quasars is now thought to be powered by supermassive black holes, microquasars are phenomena within our galaxy centered on a solar-mass black hole or a neutron star.

In a quasar the emission is generated by hot gases spiraling down to the supermassive black hole (often on the order of a billion solar masses) and building up in an accretion disk. Gravitational potential energy is converted to kinetic energy and friction within the disk generates extreme heat. These galaxies emit far more energy than any other known objects across the electromagnetic spectrum. This process is incredibly efficient: about 10% of the matter's rest mass can be converted into energy, compared with only about 0.5% for thermonuclear fusion.

Microquasars are much smaller objects found in our own galaxy that undergo the same processes with a much smaller central engine, and thus allow us to study the details of quasar processes close-up. Instead of consuming tens or hundreds of solar masses of gas a year, microquasars accrete at a much slower rate from a normal binary companion star. Most known microquasars have an optical and x-ray emitting accretion disk, as well as two coherent relativistic radio jets beaming out from the poles of the black hole or quasar. Because microquasars are so much smaller than quasars, they allow scientists to study fluctuations of the disk and jet on the order of days rather than years.

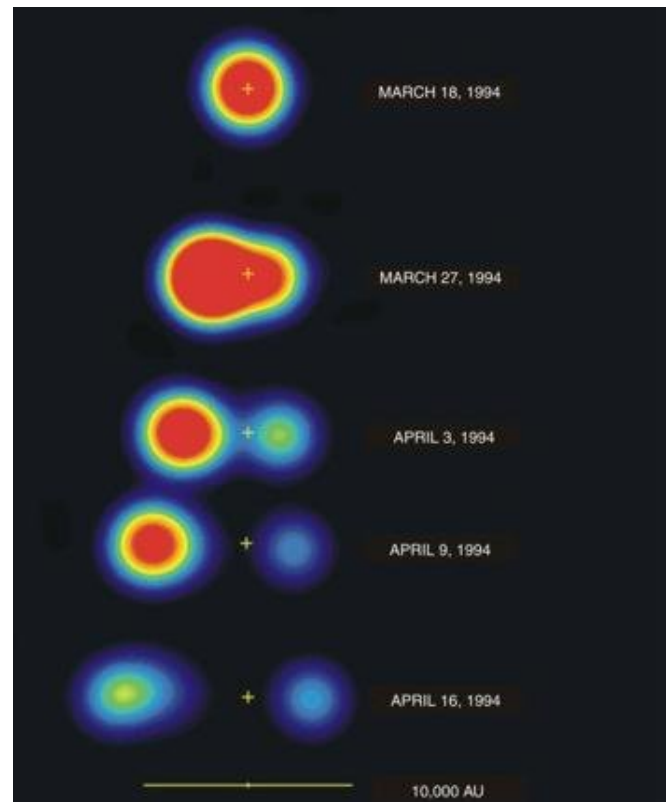
Some individual microquasars have interesting properties. SS433 is the first discovered and best-known of the microquasars. It consists of a (probably) black hole or possibly a very massive neutron star that was produced in a supernova about 10,000 years ago. It has a normal companion of about 10-30 solar masses and produces two jets traveling at 26% the speed of light from either pole. It has a notable precession in the jets of 164 days. One microquasar, GRS 1915+105, has an unbelievable jet velocity of 92% of the speed of light! The system 4U 0614+091, a microquasar 10,000 light years away in Orion,

is currently the only microquasar that is known with some certainty to contain both jets and a neutron star (rather than a black hole).



A microquasar in an artist's conception. Note the extremely red- and blue-shifted jets.

Image courtesy ESA/ Hubble



Images of jetted material from GRS 1915+105

Image courtesy NRAO/AUI

Moon Phases



		16:37	Sunset
		17:00	Venus Sets
		20:55	Moon Set
		22:40	Saturn Rises
Tue	28	01:29	First Quarter Moon
		12:54	Moon Rise

Are you a S*T*A*R Member?

S*T*A*R is the proud owner of a **monstrous 25" Dobsonian Obsession reflector** – which YOU can gain access to as a S*T*A*R member! Meetings are the first Thursday of each month, except July and August, at 8:00 PM at the King of Kings Lutheran Church, 250 Harmony Rd. in Middletown. Meeting generally consist of lectures and discussion by members or guest speakers on a variety of interesting astronomical topics. S*T*A*R is a member of United Astronomy Clubs of New Jersey (UACNJ), the Astronomical League (AL), and the International Dark Sky Association (IDA).

November Celestial Events

By J. Randolph Walton (Randy)

Day	Date	Time (LMT)	Event
Sun	5	06:33	Sunrise
		06:42	Moon Set0
		07:58	Full Moon
		11:00	S. Taurid meteors peak (ZHR 10)
		16:43	Moon Rise
		16:53	Sunset
		17:35	Jupiter Sets
Wed	8	14:12	Mercury transits the Sun, Contact I
		14:14	Mercury transits the Sun, Contact II
		16:41	Mercury, Greatest transit
		16:50	Sunset
Sat	11	06:05	Mercury Rises
		06:10	Mars Rises
		06:40	Sunrise
		16:47	Sunset
		17:50	Jupiter Sets
		22:30	Moon Rise
		23:30	Saturn Rises
Sun	12	10:00	N. Taurid meteors peak (ZHR 15)
		12:45	Last Quarter Moon
		13:08	Moon Set
Fri	17	14:50	Moon Set
		16:00	Leonid meteors peak (ZHR 15)
		16:42	Sunset
Sat	18	04:34	Moon Rise
		05:15	Mercury Rises
		06:07	Mars Rises
		06:49	Sunrise
		15:13	Moon Set
		16:41	Sunset
		23:05	Saturn Rises
Mon	20	16:10	Moon Set
		17:18	New Moon
Sat	25	05:10	Mercury Rises
		06:05	Mars Rises
		06:56	Sunrise

Memberships: () Individual....\$25
() Family...\$35

Name _____

Address _____

City _____ State ____ Zi
p _____

Phone _____

Email _____

Make checks payable to: STAR
Astronomy Society, Inc. and mail to P.O.
Box 863, Red Bank, NJ 07701

In the Eyepiece

Here is a list of objects for this month. This is reproduced from www.skyhound.com with the kind permission of its creator and author of SkyTools Greg Crinklaw.

Object(s)	Class	Con	RA	Dec	Mag
Iota Cas	Multiple Star	Cassiopeia	02h29m04.0s	+67°24'09"	4.5
6 Tri	Multiple Star	Triangulum	02h12m22.3s	+30°18'11"	4.9
Almaak	Multiple Star	Andromeda	02h03m53.9s	+42°19'47"	2.1
h and Chi Perseus	Open Clusters	Perseus	02h19m01.8s	+57°08'47"	4.3
NGC 1097	Galaxy	Fornax	02h46m18.9s	-30°16'21"	10.2
M 103	Open Cluster	Cassiopeia	01h33m13.8s	+60°42'23"	6.9
Little Dumbbell (M76)	Planetary Nebula	Perseus	01h42m19.3s	+51°34'30"	12.2
NGC 891	Galaxy	Andromeda	02h22m32.9s	+42°20'46"	10.8
NGC 1023	Galaxy	Perseus	02h40m27.7s	+39°04'04"	10.2
AGC 347	Galaxy Group	Andromeda	02h25m48.0s	+41°52'00"	--
IC 1747	Planetary Nebula	Cassiopeia	01h57m35.8s	+63°19'19"	13.6
NGC 470 & 474	Interacting Galaxy Pair	Pisces	01h19m44.9s	+03°24'35"	12.6
NGC 925	Galaxy	Triangulum	02h27m16.8s	+33°34'45"	10.9
NGC 784	Galaxy	Triangulum	02h01m16.8s	+28°50'14"	12.5